problematic the higher the zinc content in the outer layer is supposed to be. A further method could consist of providing a copper-enveloped steel wire with a zinc-containing outer layer via a dipping method. The zinc content could be adjusted at random. The difficulty with this method is to apply the outer layer with an even thickness over the circumference.

IN THE CLAIMS

Please add new Claims 6 and 7 as follows.

~~6.~~ 4 (New) The erosion electrode according to Claim ~~3,~~ 1 wherein the conductivity and the strength of the erosion electrode is from 10-18 $S \cdot m/mm^2$ and 1800-2500 N/m^2 respectively.

~~7.~~ 5 (New) The erosion electrode according to Claim ~~3,~~ 1 wherein the erosion electrode has a diameter of less than 10 µm.

REMARKS

The specification has been amended in order to correct errors contained therein. No new matter has been added. Newly presented Claims 6 and 7 are directed to specific embodiments of the present invention. No new matter has been added.

Claims 3-5 have been rejected under 35 USC 103(a) as being unpatentable over Yamamoto et al. Applicants respectfully traverse this ground of rejection and urge reconsideration in light of the following comments.

The presently claimed invention is directed to an erosion electrode consisting of a patented steel core and an outer layer containing 40-60 wt.% zinc. The patented steel core contains carbon in an amount of from 0.6-1 wt.% and occupies an area of 50-75% of the cross-sectional area of the erosion electrode.

The present invention is based on the discovery that by providing a steel core of an erosion electrode with a patented structure, the erosion electrode has a high strength and deformability and comparatively high conductivity. The erosion electrodes of the present invention can replace more expensive electrodes and yet provide a cutting quality with a high degree of exactness in contours. Moreover, the erosion electrodes of the present invention are significantly less expensive to manufacture, exhibit no aging, have lower raw material costs, offer a higher safety in manufacture and have constant erosion characteristics when compared with prior art electrodes. It is respectfully submitted that the presently claimed invention is patentably distinguishable over the Yamamoto et al reference.

The Yamamoto et al reference discloses a cut wire for electrical discharge machining which has a core of stainless steel and a covering layer of copper or a copper alloy provided around the core. The diameter and tensile strength of the cut wire and the percentage of the sectional area of the core to the entire cut wire are critical parameters in the disclosed wire. The ratio of the core area to the total area of the wire is from 30-90% and the tensile strength of the wire is from 40-200 Kg/mm^2. The diameter of the wire is limited to 0.05 to 0.4 mm. As stated by this reference, the diameter of the wire must be greater than 0.05 mm because there is a possibility of the wire breaking under harsh conditions due to insufficient strength at normal and high temperatures. Moreover, if the tensile strength of the wire is greater than 200 Kg/mm^2, the curling tendency necessary for use as a cut wire would not be obtained. The steel core used in this wire was SUS 304 stainless steel having a carbon content less than 0.08 wt.%. Moreover, the only specimen specifically exemplified having a brass coating used "7-3 brass" which is a copper/zinc alloy having 70% copper and 30% zinc. The conductivity of the brass-coated wire is 15%.

In contrast to the Yamamoto et al reference, the present invention requires that the stainless steel core be subjected to a patenting treatment and possess a carbon content of from 0.6-1 wt.%. Additionally, the brass coating of the present invention has a zinc content of from 40-60 wt.% and not the 30 wt.% shown in Yamamoto et al. Additionally, newly presented Claim 7 requires that the erosion electrode have a diameter of less than 10 microns. The smallest diameter permitted in Yamamoto et al is 50 microns. Therefore, Applicants respectfully submit that the presently claimed invention is not a product substantially similar to the product disclosed in Yamamoto et al.

Although the Yamamoto et al reference does not present a showing of prima facie obviousness with respect to the presently claimed invention, Applicants respectfully submit that the properties associated with the presently claimed invention are clearly unexpected in light of the disclosure of Yamamoto et al. The erosion electrodes of the present invention have a conductivity of at least 10 $S \cdot m/mm^2$ and a strength of at least 1800 N/m^2. The closest electrode specifically disclosed in Yamamoto et al, Sample No. 8, to that of the present invention has a conductivity of only 15% and a mechanical strength of 139 Kg/mm^2, which translates to 1363 N/m^2. These values clearly are below those required by the presently claimed invention and patentably distinguishes the presently claimed invention thereover.

Upon allowance of the elected claims, the Examiner is given permission to cancel the non-elected claims without prejudice to the filing of a divisional application thereon. Reconsideration of the present application and the passing of it to issue is respectfully solicited.

Respectfully submitted,

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Encl: Marked-Up Amended Specification Paragraphs
Postal Card

136.0112

IN THE SPECIFICATION

Please amend paragraphs **[0001]** and **[0009]** of the specification as follows.

Please replace paragraph **[0001]** with the following rewritten paragraph.

[0001] This application is a continuation-in-part of U.S. Serial No. ~~09/202 211~~09/202 221, filed December 9, 1998.

Please replace paragraph **[0009]** with the following rewritten paragraph.

[0009] A wire electrode of the invention could be manufactured in such a manner that a sleeve out of a brass pipe or brass band is applied to a steel core enveloped with copper, and the composite is thereafter reduced by means of wire drawing. This type of manufacture becomes more problematic the higher the zinc content in the outer layer is supposed to be. A further method could consist of providing a copper-enveloped steel wire with a zinc-containing outer layer via a dipping method. The zinc content could ~~here by~~be adjusted at random. The difficulty with this method is to apply the outer layer with an even thickness over the circumference.